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UNITED STATES DISTRICT COURT

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NORTHERN DISTRICT OF CALIFORNIA

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SAN JOSE DIVISION

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TWILIO, INC.,

Case No. 16-CV-06925-LHK

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Plaintiff,

ORDER CONSTRUING DISPUTED CLAIM TERMS OF U.S. PATENT NOS. 8,306,021; 8,837,465; AND 8,755,376

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v.

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TELESIGN CORPORATION,

Re: Dkt. No. 105

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Defendant.

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18   Plaintiff Twilio, Inc. ("Twilio" or "Plaintiff") brings this action for patent infringement

19   against Defendant Telesign Corporation ("Telesign" or "Defendant"). The parties now seek

20   construction of nine disputed terms used in the claims of the following patents-in-suit: U.S. Patent

21   Nos. Patent Nos. 8,306,021 ("the '021 Patent"), 8,837,465 ("the '465 Patent"), 8,755,376 ("the

22   '376 Patent") (collectively, "Asserted Patents").

23   **I.   BACKGROUND**

24   **A. Background and Description of the Invention**

25   The '021 patent is titled "System and Method for Processing Telephony Sessions."

26   Compl. Ex. A ('021 patent). It was filed on April 2, 2009 and issued on November 6, 2012. It

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claims priority to three provisional applications, the earliest of which was filed on April 2, 2008.

The '465 and '376 patents are also titled "System and Method for Processing Telephony Sessions." Compl. Ex. B ('465 patent); Compl. Ex. C ('376 patent). The '465 patent was filed on January 16, 2013 and issued on September 16, 2014. The '376 patent was filed on January 16, 2013 and issued on June 17, 2014. Both patents are continuations of another patent application, which is a continuation of the '021 patent. Accordingly, all three Asserted Patents share the same specification and priority date.

1. Specification

The Asserted Patents generally relate to "[a] system and method for processing telephony sessions." '021 patent at col. 1:25-26. Telephony sessions, such as a phone call initiated over a public switched telephone network ("PSTN") or a text message sent over the Short Message Service (SMS), are communications from one point to another. *See id*. at col. 3:16-53. However, these communications can be combined with computer logic to create interactive applications, such as an automated customer service hotline, *see id.* at col. 15:60-65, or a dial-in conferencing service, *see id.* at col. 16:11-20. In order to accomplish this, communication signals need to be "processed" so that input from the user (e.g., a button pressed, text sent, spoken response) is sent to the computer logic, and the appropriate response is sent back. *See generally id*. at col. 6:48-8:5. For example, processing a call to a customer service hotline would include detecting that the user selected, say, a "2" from the initial menu, and then retrieving and playing a recording for the new set of menu options to which option "2" corresponds. *See, e.g.*, *id.* at col. 15:49-16:4, Fig. 7.

The Background section of the specification explains that, at the time of patenting, implementation of these interactive applications was complicated. *Id*. at col. 1:30-58. At that time, "legislation and the advent of Voice over Internet Protocol (VoIP) ha[d] revolutionized the communication industry." *Id*. at col. 1:30-32. There were new technologies for interactive applications, accompanied by new business models, and service providers. *Id*. at col. 1:32-33. For example, "[o]ne c[ould] implement extensible call switching and voice application logic in

1   Open source software applications, such as Asterisk and FreeSwitch." *Id*. at col. 1:34-36.

2   However, getting these modern applications to work with traditional communications networks—

3   such as telephone networks that handled voice communications and SMS messaging—presented

4   "new complexities and challenges." *Id*. at col. 1:38. In particular, "[d]eploying telephony services

5   require[d] knowledge of voice networking and codecs, hardware or services to bridge servers to

6   the public phone infrastructure, capital investment in hardware, and ongoing collocation of that

7   hardware." *Id*. at col. 1:39-43. In addition, the actual interactive application itself had to be

8   developed, which "require[d] developers to train in new languages, tools, and development

9   environments." *Id*. at col. 1:45-46. Finally, "[o]ngoing operation and maintenance of these

10   services require[d] teams to adopt new analysis tools, performance metrics, and debugging

11   methodologies." *Id*. at col. 1:50-53. All of these efforts were costly, requiring "significant

12   upfront and ongoing investment." *Id*. at col. 1:54-55.

13   The Asserted Patents purport to address these problems by providing a way for modern

14   applications to interact with traditional communication networks that mimics web-based

15   programming. *See id.* at col. 2:1-18. In particular, this solution "use[s] the familiar web site

16   visitor model," where each step of a phone call is made to act like a web page. *Id*. at col. 2:5-8.

17   For example, in one embodiment, input that a user enters into his telephone (e.g., pressing a "2" in

18   the automated customer hotline example) is sent to the application via HTTP POST, the same

19   mechanism that is used when a user submits a form on a website. *See id*. at col. 4:49-57, Fig. 7.

20   The methods and systems also leverage "familiar concepts such as HTTP redirects, accessing

21   resources through an API, cookies, and mime-type responses." *Id*. at col. 2:9-11. According to

22   the Asserted Patents, this reduces complexity and expense because it "enables web developers to

23   use their existing skills and tools with the esoteric world of telephony, making telephony

24   application development as easy as web programming." *Id*. at col. 2:2-5.

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In the Asserted Patents, the ability to interact with a traditional communication network in a web-like way is accomplished through a "call router," which sits between the traditional communication network and the modern application and translates between the two. *Id*. at col. 6:49-8:5, 13:12-14:14. Figures 2A and 3A show this setup for a modern application communicating with a traditional phone line:
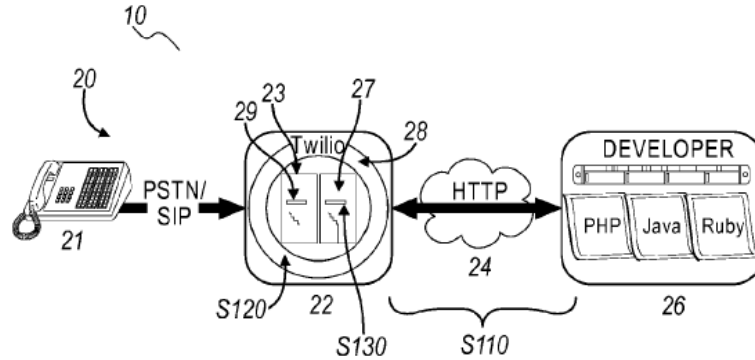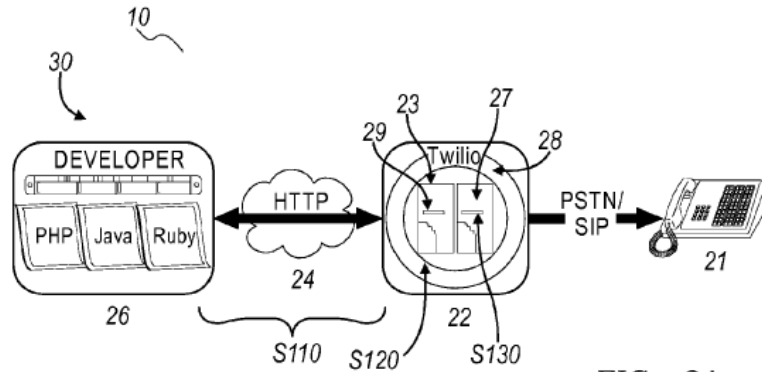
FIG. 2A

FIG. 3A

Item 26 represents a server that runs the modern application ("application server"), such as code that implements the tree of menu options in a customer service hotline. *Id*. at col. 14:15-15:47. It communicates with the call router, item 22, using familiar web-like constructs. *Id*. at col. 13:29-14:14. The call router then takes these web-based descriptions of interactions and translates them into telephone signals that can be sent to the user's telephone, item 21, over a traditional telephone network, and vice versa. *Id*. at col. 6:49-8:5, 13:12-14:14. For example, the call router is able to detect the signal indicating that a user pressed a "2" coming from a traditional telephone line, translate that into an HTTP POST response, and send that over the internet to the application

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server. *See id*. at col. 13:12-14:14, Fig. 7.

Figure 1 illustrates the operation of the call router, the application server, and the communication network:
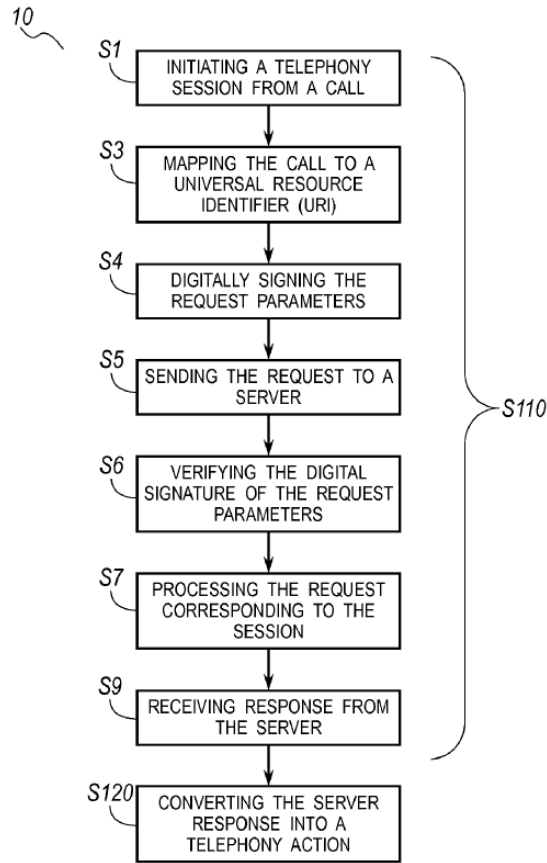

FIG. 1

The call router communicates with the application server using an "application layer protocol," such as HTTP or HTTPS. *Id*. at col. 14:24-26. The location of the application server, or an application hosted on an application server, is identified using a universal resource identifier ("URI"). *Id*. at col. 14:21-23. When a user initiates a telephony session (such as a phone call), the call router determines the URI that corresponds to the application server responsible for handling that call, and maps the call to that URI. *Id*. at col. 3:54-4:10. (For example, if a user calls a dial-in voice conferencing number, the call router maps that number to the URI for the server hosting the conferencing application. *See id*. at col. 3:54-4:10, 15:51-54.) The call router then communicates

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1 that a new call was initiated to the application server by digitally signing any parameters

2 associated with the call, such as the caller's number, the number they are calling, and their account

3 ID, and sending this information to the application server as a web request. *Id*. at col. 4:11-5:46,

4 13:29-14:14, Figs. 4A-F. The application server then determines the next action that should be

5 taken, and sends this information back to the call router as a response. *Id*. at col. 6:15-48, Figs.

6 5A-B. (For example, if a user calls a dial-in voice conferencing number, the conferencing

7 application may determine that the next step would be to play a greeting asking the user to enter

8 his conference ID. *See id.* at Fig. 7. In this case, it sends back a response to the call router with an

9 audio file for this greeting and instructions to play it. *See id.*) The call router receives this

10 response and converts it into a "telephony action." *Id*. at col. 6:49-8:5. It does this by sending the

11 appropriate signals over the telephone network to the user's phone. *Id*. at col. 6:49-64. Any

12 subsequent input from the user is processed as a new request using this same request and response

13 pattern. *See, e.g.*, *id.* at Figs. 12-15.

14   In addition to translating and relaying signals between the communication network and the

15 application server, the call router also stores state information about the telephony session, such as

16 the number associated with a particular call, *id.* at col. 10:1-4, the number to which a call was

17 directed, *id.* at col. 10:29-32, or the current state of a call (e.g., in-progress, completed, failed, not

18 yet initiated), *id.* at col. 10:40-42. It then makes this information accessible to the application

19 server through a Call Router Application Programming Interface ("API"), which the application

20 server can use at any time. *Id.* at col. 8:52-54; *see generally id.* at col. 8:7-12:64. In addition, the

21 application server can use the Call Router API to direct the call router to take certain actions, such

22 as modify information stored by the call router relating to calls or perform operations on an

23 existing call. *Id.* at col. 9:42-48. For example, the application server can direct the call router to

24 modify data about the number from which a call was initiated, *id.* at col. 10:1-4, or change the

25 state of a current call (e.g., hanging up a current call, transferring a current call, or initiating

26 recording of a current call), *id.* at col. 10:42-53.

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This functionality is implemented through "resources" located on the call router, which are web-accessible data elements that each are associated with their own URIs. *Id.* at col. 9:33-40. Using the Call Router API, the application server can access or modify a resource by performing HTTP actions (e.g., POST, PUT, GET, or DELETE) on its associated URI. *Id.* For example, information about the number from which a particular call was initiated is associated with the "caller ID resource." *Id.* at col. 10:1-4. To request the number from which a particular call was initiated, the application server can send a GET request to the URI of the caller ID resource. *See id.* at col. 9:42-46, 10:1-4. The call router then sends a response to the application server with that information. *Id.* at col. 10:1-4. These resources allow the application server to access information it needs about the telephony session using familiar web-programming constructs. *See id.* at col. 8:7-51.

2. Asserted Claims

Twilio currently asserts no more than 22 claims across the three Asserted Patents. *See* ECF No. 74. Of these, the parties' claim construction disputes concern the following claims: claims 1-3, 6, 7, and 12 of the '021 patent; claims 1, 4, 5, 9, and 13 of the '465 patent; and claims 1, 3, 5, 14, 16, and 19 of the '376 patent. ECF Nos. 105, 110, 114-4.

B. Procedural History

On December 1, 2016, Twilio filed the instant patent infringement suit. In its complaint, Twilio alleged that Telesign "has infringed and continues to infringe one or more claims of [the Asserted Patents and U.S. Patent Nos. 8,738,051 ("the '051 Patent"), 8,737,962 ("the '962 Patent"), 9,270,833 ("the '833 Patent"), and 9,226,217 ("the '217 Patent")]." Compl. ¶ 75, 91, 106, 135, 156, 169, 184. The products accused included Telesign's "Smart Verify product," "Auto Verify product," "SMS Verify product," "Voice Verify Product," "Push Verify product," and "Score and Phone ID products." *Id.* ¶¶ 40-45.

On January 25, 2017, Telesign moved to dismiss all of Twilio's infringement claims because the asserted claims were invalid for failure to claim patent-eligible subject matter pursuant

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1   to 35 U.S.C. § 101. ECF No. 31. On March 31, 2017, the Court granted Telesign's motion with

2   respect to U.S. Patent Nos. 8,737,962 and 9,270,833, but denied Telesign's motion with respect to

3   the Asserted Patents. ECF No. 57. On April 17, 2017, the Court granted Telesign's motion with

4   respect to U.S. Patent Nos. 8,738,051 and 9,226,217. ECF No. 64.

5   On June 30, 2017, the parties submitted a Joint Claim Construction and Prehearing

6   Statement. ECF No. 87 ("Joint Statement"). On August 14, 2017, Twilio filed its Opening Claim

7   Construction Brief. ECF No. 105 ("Opening Br." or "Opening Brief"). On August 28, 2017,

8   Telesign filed its Responsive Claim Construction Brief. ECF No. 110 ("Responsive Brief" or

9   "Resp. Br."). On August 29, 2017, the Court issued an order striking portions of the Opening

10   Brief and Responsive Brief because those portions covered terms that were not identified in the

11   parties' Joint Statement as terms that "will be the most significant to this case." ECF No. 111.

12   On September 5, 2017, Twilio filed its Reply Claim Construction Brief. ECF No. 114-4 ("Reply

13   Brief" or Reply Br."). The Court held a tutorial and claim construction hearing on October 5,

14   2017 ("*Markman* hearing").

15   **II.   LEGAL STANDARD**

16   **A. Claim Construction**

17   The Court construes patent claims as a matter of law based on the relevant intrinsic and

18   extrinsic evidence. *See Lighting Ballast Control LLC v. Philips Elecs. N. Am. Corp.*, 744 F.3d

19   1272 (Fed. Cir. 2014) (en banc); *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc).

20   "Ultimately, the interpretation to be given a term can only be determined and confirmed with a full

21   understanding of what the inventors actually invented and intended to envelop with the claim."

22   *Phillips*, 415 F.3d at 1316 (internal quotation marks and citation omitted). Accordingly, a claim

23   should be construed in a manner that "stays true to the claim language and most naturally aligns

24   with the patent's description of the invention." *Id.*

25   In construing disputed terms, a court looks first to the claims themselves, for "[i]t is a

26   'bedrock principle' of patent law that 'the claims of a patent define the invention to which the

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patentee is entitled the right to exclude.'" *Id.* at 1312 (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). Generally, the words of a claim should be given their "ordinary and customary meaning," which is "the meaning that the term[s] would have to a person of ordinary skill in the art in question at the time of the invention." *Id.* at 1312-13. In some instances, the ordinary meaning to a person of skill in the art is clear, and claim construction may involve "little more than the application of the widely accepted meaning of commonly understood words." *Id.* at 1314.

In many cases, however, the meaning of a term to a person skilled in the art will not be readily apparent, and a court must look to other sources to determine the term's meaning. *See id.* Under these circumstances, a court should consider the context in which the term is used in an asserted claim or in related claims and bear in mind that "the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification." *Id.* at 1313. The specification "'is always highly relevant'" and "'[u]sually . . . dispositive; it is the single best guide to the meaning of a disputed term.'" *Id.* at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). Indeed, "the only meaning that matters in claim construction is the meaning in the context of the patent." *Trs. of Columbia Univ. v. Symantec Corp.*, 811 F.3d 1359, 1363 (Fed. Cir. 2016). Where the specification reveals that the patentee has given a special definition to a claim term that differs from the meaning it would ordinarily possess, "the inventor's lexicography governs." *Id.* at 1316. Likewise, where the specification reveals an intentional disclaimer or disavowal of claim scope by the inventor, the inventor's intention as revealed through the specification is dispositive. *Id.*

In addition to the specification, a court may also consider the patent's prosecution history, which consists of the complete record of proceedings before the United States Patent and Trademark Office ("PTO") and includes the cited prior art references. The prosecution history "can often inform the meaning of the claim language by demonstrating how the inventor

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understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be." *Id.* at 1317.

A court is also authorized to consider extrinsic evidence in construing claims, such as "expert and inventor testimony, dictionaries, and learned treatises." *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 980 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996). Expert testimony may be particularly useful in "[providing] background on the technology at issue, . . . explain[ing] how an invention works, . . . ensur[ing] that the court's understanding of the technical aspects of the patent is consistent with that of a person of skill in the art, or . . . establish[ing] that a particular term in the patent or the prior art has a particular meaning in the pertinent field." *Phillips*, 415 F.3d at 1318. Although a court may consider evidence extrinsic to the patent and prosecution history, such evidence is considered "less significant than the intrinsic record" and "less reliable than the patent and its prosecution history in determining how to read claim terms." *Id.* at 1317-18 (internal quotation marks and citations omitted). Thus, while extrinsic evidence may be useful in claim construction, ultimately "it is unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence." *Id.* at 1319. Any expert testimony "that is clearly at odds with the claim construction mandated by the claims themselves, the written description, and the prosecution history" will be significantly discounted. *Id.* at 1318 (internal quotation marks and citation omitted). Finally, while the specification may describe a preferred embodiment, the claims are not necessarily limited only to that embodiment. *Id.* at 1323; *see also Prima Tek II, L.L.C. v. Polypap, S.A.R.L.*, 318 F.3d 1143, 1151 (Fed. Cir. 2003) ("The general rule, of course, is that claims of a patent are not limited to the preferred embodiment, unless by their own language.").

B. Indefiniteness

Under 35 U.S.C. § 112, ¶ 2 (2006 ed.),[1] a patent must "conclude with one or more claims

_____

[1] Paragraph 2 of 35 U.S.C. § 112 was replaced with newly designated § 112(b) when § 4(c) of the America Invents Act ("AIA"), Pub. L. No. 112-29, took effect on September 16, 2012. Because the applications resulting in the patents at issue in this case are continuations of applications that

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particularly pointing out and distinctly claiming the subject matter which the applicant regards as [the] invention." Section 112, ¶ 2 includes what is commonly called the "definiteness" requirement. *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2125 (2014). In *Nautilus*, the United States Supreme Court held that "a patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus*, 134 S. Ct. at 2124. As the Court observed, § 112, ¶ 2 "entails a 'delicate balance.'" *Id*. (quoting *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 731 (2002)). "On the one hand, the definiteness requirement must take into account the inherent limitations of language." *Id*. (citing *Festo*, 535 U.S. at 731). "At the same time, a patent must be precise enough to afford clear notice of what is claimed, thereby 'appris[ing] the public of what is still open to them.'" *Id*. (quoting *Markman*, 517 U.S. at 373). Thus, "the certainty which the law requires in patents is not greater than is reasonable, having regard to their subject-matter." *Id*. at 2129 (quoting *Minerals Separation v. Hyde*, 242 U.S. 261, 270 (1916)).

The Federal Circuit applied the *Nautilus* standard in *Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364 (Fed. Cir. 2014). The case involved two patents which covered an "attention manager for occupying the peripheral attention of a person in the vicinity of a display device." *Id.* at 1366. In one embodiment, the patents involved placing advertising on websites in areas surrounding the principal content of the webpage, for example in the margins of an article. Several of the asserted claims included a limitation that the advertisements ("content data") would be displayed "in an unobtrusive manner that does not distract a user of the display device." *Id.* at 1368. The district court found that the terms "in an unobtrusive manner" and "does not distract the user" were indefinite, and the Federal Circuit affirmed. *Id.* at 1368-69. The Federal Circuit found that the "'unobtrusive manner' phrase is highly subjective and, on its face, provides little guidance to one of skill in the art" and "offers no objective indication of the manner in which

were filed before that date, the Court refers to the pre-AIA version of § 112.

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1   content images are to be displayed to the user." *Id.* at 1371. Accordingly, the Court looked to the

2   written description for guidance. The Court concluded that the specification lacked adequate

3   guidance to give the phrase a "reasonably clear and exclusive definition, leaving the facially

4   subjective claim language without an objective boundary." *Id.* at 1373. Accordingly, the claims

5   containing the "unobtrusive manner" phrase were indefinite.

6   In applying the *Nautilus* standard, the Federal Circuit has cautioned that "the dispositive

7   question in an indefiniteness inquiry is whether the 'claims,' not particular claim terms" fail the

8   *Nautilus* test. *Cox Commc'ns, Inc. v. Sprint Commc'n Co. LP*, 838 F.3d 1224, 1231 (Fed. Cir.

9   2016). For that reason, a claim term that "does not discernably alter the scope of the claims" may

10   fail to serve as a source of indefiniteness. *Id.* For example, in *Cox Communications*, the Federal

11   Circuit determined that the term "processing system" did not render the method claims at issue

12   indefinite because "the point of novelty resides with the steps of these methods, not with the

13   machine that performs them." *Id.* at 1229. Thus, the court reasoned, "[i]f 'processing system'

14   does not discernably alter the scope of the claims, it is difficult to see how this term would prevent

15   the claims . . . from serving their notice function under § 112, ¶ 2." *Id.*

16   The Court therefore reviews the claims, specification, and prosecution history to determine

17   whether the claims "inform, with reasonable certainty, those skilled in the art about the scope of

18   the invention." *Nautilus*, 134 S. Ct. at 2124. Indefiniteness renders a claim invalid, and must be

19   shown by clear and convincing evidence. *See Halliburton Energy Servs. v. M-I LLC*, 514 F.3d

20   1244, 1249 (Fed. Cir. 2008); *cf. Nautilus*, 134 S. Ct. at 2130 n.10.

21   **III.   DISCUSSION**

22   The parties request construction of nine[2] terms across the Asserted Patents. The Court

23   discusses each in turn.

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27   [2] Although discussed in separate sections below, the Court counts "REST API" and "REST API response" as one.

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A. "URI" ('021 patent, claims 1-3, 7; '465 patent, claim 1; '376 patent, claims 1, 14, 16)

Twilio's Proposed Construction	Telesign's Proposed Construction	Parties' Agreed-Upon Construction
Uniform Resource Identifier (URI), which is a compact sequence of characters that identifies an abstract or physical resource	No construction necessary. *Alternatively:* Uniform Resource Identifier	a compact sequence of characters that identifies an abstract or physical resource

The term "URI" appears in claims 1-3 and 7 of the '021 patent, claim 1 of the '465 patent, and claims 1, 14, and 16 of the '376 patent. For example, claim 1 of the '021 patent recites:

> 1. A method of processing telephony sessions comprising:
>
> communicating with an application server using an application layer protocol;
>
> processing telephony instructions with a call router;
>
> creating call router resources accessible through a call router Application Programming Interface (API), wherein the call router resources are accessible by outside devices at an addressable **Uniform Resource Identifier (URI)**;
>
> mapping a telephony session to the **URI**, the **URI** being associated with the application server;
>
> sending a request to the application server;
>
> embedding state information of the telephony session in the request;
>
> receiving from the application server a response comprising telephony instructions for sequential processing;
>
> storing state information in the **URI** of a call router resource;
>
> modifying call router resources to alter the state of the call router; and
>
> interacting with media of the call router according to the call router API.

'021 patent at col. 18:34-55 (emphasis added).

1. The Parties' Compromise

Initially, the parties proposed different constructions for this term. Twilio proposed that "URI" should be construed as "Uniform Resource Identifier (URI), which is a compact sequence of characters that identifies an abstract or physical resource." Opening Br. 5-6. Telesign, on the other hand, proposed that "URI" required no construction, or, in the alternative, should be construed to mean "Uniform Resource Identifier." Responsive Br. 5-6. However, at the *Markman*

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hearing, the parties reached an agreement that "URI" should be construed to mean "a compact

sequence of characters that identifies an abstract or physical resource." For the reasons discussed

below, the Court agrees that "URI" should be construed as "a compact sequence of characters that

identifies an abstract or physical resource."

2. Analysis of Compromise Position

a. Claim Language

The claim language supports the portion of the parties' compromise construction which

requires that a "URI" "identifies an abstract or physical resource." Claim 1 of the '021 patent

requires that a URI is "addressable" and used for accessing resources, such as accessing "call

router resources . . . by outside devices." '021 patent at col. 18:34-55. Claim 1 of the '465 patent

and claims 1, 14, and 16 of the '376 patent recite similar requirements. '465 patent at col. 18:38-

54 (reciting an "application resource specified by the URI"); '376 patent at col. 18:29-45 (reciting

a "resource API"), col. 19:18-22 (reciting an "API resource URI"), col. 19:27-31 (same).

b. Specification

The specification supports the entirety of the parties' compromise construction. First, the

specification confirms that the "URI" is "a compact sequence of characters." The specification

consistently provides examples of URIs which are precisely this, including:

- http://demo.twilio.com/myapp/{dialed phone number}/{originating phone number}
  or http://demo.twilio.com/myapp/foo.php?dialed_number={dialed phone
  number}&originating_number={originating phone number}. '021 patent at col.
  4:4-10.
- http://demo.twilio.com/foo.php?digits=1234. *Id.* at col. 7:53-54.
- http://demo.twilio.com/myapp/1234.mp3. *Id.* at col. 7:57.

Such "repeated[] and consistent[]" usage "strongly suggests" that "a compact sequence of

characters" should be read as part of the claim. *See Virnetx, Inc. v. Cisco Sys., Inc.*, 767 F.3d

1308, 1318 (Fed. Cir. 2014); *see also GPNE Corp. v. Apple Inc.*, 830 F.3d 1365, 1370 (Fed. Cir.

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2016) ("[W]hen a patent 'repeatedly and consistently' characterizes a claim term in a particular

way, it is proper to construe the claim term in accordance with that characterization.") (citations

omitted).

Second, the specification also confirms that the "URI" "identifies an abstract or physical

resource." The specification discloses that, during the process of communicating with an

application server, calls are mapped to URIs, which "function[] to enable a telephony session to be

converted into format that may be handled with standard web servers and web application." '021

patent at col. 3:54-57. The specification also discloses that, when making call router "resources"

accessible through the call router API, the "resource is preferably addressed by a persistent URI."

Id. at col. 9:36-37. Thus, in both cases, the URI is used to identify an abstract resource—either a

resource which represents the telephony session or a call router resource. Further, the

specification does not disclose any instances where a URI is not used to identify a resource. *See*

'021 patent at col. 4:4-10, 7:47-57. Accordingly, in light of this "repeated[] and consistent[]"

disclosure, *Virnetx*, 767 F.3d at 1318, the specification supports construing URI as "identif[ying]

an abstract or physical resource."

c. Extrinsic Evidence

Extrinsic evidence also supports the entirety of the parties' compromise construction. The

language for the parties' compromise construction comes directly from RFC 3986, the industry

standard at the time for URI syntax. Opening Br. Ex. A at 2 ("A Uniform Resource Identifier

(URI) is a compact sequence of characters that identifies an abstract or physical resource."). Both

parties and their experts appear to agree that this is an accurate reflection of what a person of

ordinary skill in the art would have understood "URI" to mean at the time of invention. *See*

Opening Br. 5 ("The Internet Engineering Task Force (IETF) published RFC 3986, which was and

is the standard in the industry for URI syntax as it is used in the Internet."); Opening Br. Ex. B

¶ 24 ("RFC 3986, published in 2005 by the IETF, defined the term URI, and is still the definition

of the term used today by persons of ordinary skill in the art"); Responsive Br. 5 ("those of skill in

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the art would understand that "URI" means a 'Uniform Resource Identifier,' as defined by RFC

3986"); Opening Br. Ex. C at 37:23-38:1 ("There is an RFC that sets forth the standardized syntax

for a URI, and so that's—the definition of a URI comes from that standards document."). Thus,

extrinsic evidence supports the parties' compromise construction.

d. Conclusion

In sum, the parties' compromise construction is consistent with the claim language and

specification, and is taken verbatim from the industry standard that both parties agree reflect what

a person of ordinary skill in the art would have understood "URI" to mean at the time of the

invention. Therefore, the Court adopts the parties' compromise construction and construes "URI"

to mean "a compact sequence of characters that identifies an abstract or physical resource."

B. "REST API/representational state transfer (REST) API" ('376 patent, claim 1)

Twilio's Proposed Construction	Telesign's Proposed Construction
An application programming interface that is operable with the Representation State Transfer (REST) conventions	Indefinite *Alternatively:* A programmatic communication interface using a varying level of statelessness

The term "REST API/representational state transfer (REST) API" appears in claim 1 of the

'376 patent. Claim 1 recites:

1. A method comprising:

operating a telephony network and internet connected system cooperatively
with a plurality of application programming Interface (API) resources,
wherein operating the system comprises:

initiating a telephony session,

communicating with an application server to receive an application
response,

converting the application response into executable operations to process
the telephony session,

creating at least one informational API resource; and

exposing the plurality of API resources through a **representational state
transfer (REST) API** that comprises:

16

receiving a **REST API** request that specifies an API resource URI, and

responding to the API request according to the request and the specified resource URI.

'376 patent at col. 18:29-45 (emphasis added).

Twilio argues that this term should be construed as "[a]n application programming interface that is operable with the Representation State Transfer (REST) conventions." Opening Br. 7-9. Telesign argues that this term is indefinite, or, in the alternative, that it should be construed as "[a] programmatic communication interface using a varying level of statelessness." Responsive Br. 6-13. The Court first addresses indefiniteness and then turns to the parties' competing proposals.

1. Indefiniteness

Telesign argues that the claims are indefinite because they merely recite that "REST API" is the type of API that is used, but do not clarify what it is. Responsive Br. 7. Telesign also argues that the specification does not elucidate its meaning, as it merely states that it is "familiar to many web developers" or "known in the art." *Id*. at 8 (citing '021 patent at col. 2:17-18, 8:15-17, 8:57-58, 9:16-19). Telesign further argues that extrinsic evidence does not provide clarity, but instead confirms that "REST" is a term that lacks objective criteria and is applied inconsistently in the art. *Id*. at 9-10.

Twilio, on the other hand, argues that "REST API" is definite because the specification states that this term refers to the common understanding of this term in the art, and extrinsic evidence confirms that it has a definite meaning to persons of ordinary skill in the art at the time of the invention. Opening Br. 7-9.

For the reasons discussed below, the Court finds that "REST API" does not render claim 1 of the '376 patent indefinite.

a. Claim Language

The Court begins with the claim language. Claim 1 recites that "REST" stands for "representational state transfer." '376 patent at col. 18:29-45. It also recites that "REST" is the

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1   type of API used, and clarifies that, in the patented method, it is used to "specif[y] an API resource

2   URI." *Id*. It does not, however, further detail what "REST" is. *See id*.

3   **b. Specification**

4   The specification, however, begins to fill in this gap. Several times, the specification states

5   that "REST" is simply "REST" as it is known in the art. '021 patent at col. 2:17-18 ("preferably a

6   REST API as is familiar to many web developers"); *id*. at col. 5:18-20 ("RESTful is understood in

7   this document to describe a Representational State Transfer architecture as is known in the art.");

8   *id*. at col. 8:16-17 ("REST API (Representational State Transfer) as is known in the art"); *id*. at

9   col. 11:60 ("as is common in RESTful architectures"); *id*. at col. 11:64-66 ("Using RESTful

10 principles such as POST or PUT to alter the state of an individual call resource.").[3] Thus, reading

11 the claims in light of the specification, "REST" simply refers to the common understanding that a

12 person of ordinary skill in the art would have had of "REST" at the time of the invention.

13   Telesign's arguments to the contrary are not persuasive. At the *Markman* hearing,

14 Telesign argued that the '376 patent uses a different definition of "REST" than the common

15 understanding that a skilled artisan would have had because the specification indicates that

16 "REST" may or may not be stateful, whereas the common understanding in the art was that

17 "REST" was stateless. As support, Telesign relied on two isolated quotations from the

18 specification: (1) "[t]he RESTful HTTP requests are preferably stateless" '021 patent at col. 5:20;

19 and (2) "a varying level of a RESTful communication (statelessness) may be used," *id*. at col.

20 5:38-40. The Court disagrees that either of these excerpts show that the '376 patent intended

21 "REST" as recited in claim 1 to have a different meaning than that which was understood in the

22

23 _____

24 [3] Telesign argues that, in these excerpts, the specification blurs the meaning of "REST" because it sometimes refers to "REST," sometimes refers to something "similar to" "REST," and sometimes refers to "RESTful." Responsive Br. 8. The Court disagrees. As the extrinsic evidence shows, a

25 skilled artisan would understand "REST" and "RESTful" (the adjective version) to share the same meaning. *See, e.g.*, Responsive Br. Ex. D at 80 (using both "REST" and "RESTful"). Further,

26 Telesign takes the specification's use of "similar to" "REST" out of context. This is used to describe preferred embodiments of the Call Router API, not the meaning of "REST" itself. *See*

27 '021 patent at col. 8:53-62, 9:16-19.

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art. As to the first excerpt, this is immediately proceeded by the definitional statement that "RESTful is understood in this document to describe a Representational State Transfer architecture as is known in the art." *Id*. at col. 5:18-20. A person of ordinary skill in the art would read these sentences together and not interpret one as contradicting the other. As to the second excerpt, Telesign takes this excerpt out of context. This excerpt does not state that "REST" itself has varying levels of statelessness, but only that embodiments of the "HTTP request" may have varying levels of statelessness. *See id*. at col. 5:38-40. Thus, Telesign's view is incorrect.

Accordingly, the specification makes clear that "REST" as recited in claim 1 simply refers to the common understanding that a person of ordinary skill in the art would have had of "REST" at the time of invention. The question of indefiniteness then turns on whether there indeed was a common understanding of "REST" at the time of invention such that a person of ordinary skill in the art would be able to read claim 1 and know its scope with reasonable certainty. *See Nautilus*, 134 S. Ct. at 2124. The claims, specification, and prosecution history provide no further clarification on this point, so the Court turns to extrinsic evidence.

c. Extrinsic Evidence

Extrinsic evidence confirms that there was a common understanding of "REST" at the time of invention. The parties and their experts agree that "REST" was coined by Dr. Roy Fielding in his Ph.D. dissertation in 2000. Opening Br. 8; Opening Br. Ex. D ¶ 33; Opening Br. Ex. F at 82; Opening Br. Ex. G ¶ 13; Responsive Br. 9. According to Dr. Fielding, "REST is defined by four interface constraints: identification of resources; manipulation of resources through representations; self-descriptive messages; and, hypermedia as the engine of application state." Opening Br. Ex. F at 82. Since then, "REST" has become the subject of numerous web design textbooks. Opening Br. Ex. G ¶ 12; Responsive Br. Ex. D; Responsive Br. Ex. E. These web design textbooks detail how a skilled artisan can implement an interface that respects these constraints, including how a person of ordinary skill in the art could distinguish between a design that is "RESTful" and a design that is not. For example, in *RESTful Web Services*, the author

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describes in detail how an RPC-style service differs from a RESTful service and provides

examples of each. *See* Responsive Br. Ex. D at 15-17. Further, Telesign itself has used "REST"

in its own advertising, touting that its "web services conform to the industry standard REST Web

Service Design Model." Opening Br. Ex. H.

The parties' own experts also each acknowledge that, at the time of the invention, there

were a number of commonly understood principles regarding "REST." Unsurprisingly, Twilio's

expert, Dr. Almeroth, opines that a person of ordinary skill in the art would have been able to

determine whether a design was RESTful and identifies a number of principles which characterize

RESTful designs. Opening Br. Ex. G ¶ 21 (explaining that, in RESTful designs, "each REST

resource (and their subresources) may be identified by its unique URI (Uniform Resource

Identifier)" and that "REST also emphasizes a stateless communication between the client and

server, caches data, and uses HTTP return codes and media types."); *see also id*. ¶¶ 19-22

(explaining the bases for his opinion that a person of ordinary skill in the art would be able to

determine whether a design is RESTful). However, in declarations submitted here and also in

support of Telesign's *inter partes* review petition, Telesign's expert, Dr. Neilson, also appears able

to identify certain principles that characterize RESTful designs. *See, e.g.*, Opening Br. ¶ 36

("[S]tatelessness is one thing that is almost universally acknowledged as a characteristic of

REST."); *id*. ¶ 38 ("[T]ypically requests according to RESTful principles cannot alter state.");

Reply Br. Ex. O ¶ 69 ("[O]ne convention that is often used for REST is to use HTTP not only for

transport, but also for the operation on resources. . . . . Another common convention in RESTful

API's to have the server keep no state and instead each individual request contains all of the state

necessary to perform the operation."). He also provides an explicit example of a message that

conforms with REST:

> 69. For example, the format of a message conforming with REST conventions for
> requesting a stock quote from a web service might have a format similar to the
> following:
>
> GET http://webservicex.net/GetQuote/Symbol HTTP 1.1
> Host: webservicex.net

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            Accept-Language: en-us
            Accept-Encoding: gzip, deflate
            Connection: Keep-Alive

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Id. ¶ 69. In addition, he generally acknowledges that "REST-based architectures and API's were

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well known in the art at the time of the filing of the '376 patent." *Id*. ¶ 61; *see also id*. ¶ 63. Thus,

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taken collectively, the extrinsic evidence shows that there was a common understanding of

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"REST" in the art such that a person of ordinary skill would know the scope of the claims with

reasonable certainty.

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        The fact that "REST" was defined by a set of constraints rather than a rigid specification

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does not alter this conclusion. Instead, "[c]laims reciting terms of degree 'ha[ve] long been found

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definite'" so long as they "provide 'some standard for measuring that [term of] degree.'" *Mentor*

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Graphics Corp. v. EVE-USA, Inc., 851 F.3d 1275, 1290 (Fed. Cir. 2017) (quoting *Biosig*

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Instruments, Inc. v. Nautilus, Inc., 783 F.3d 1374, 1378 (Fed. Cir. 2015)). For example, in

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Nautilus, the Federal Circuit concluded that "spaced relationship" did not render the claims

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indefinite because a "skilled artisan would understand the inherent parameters of the invention as

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provided in the intrinsic evidence." *Id*. at 1384. Similarly, in *DDR Holdings, LLC v. Hotels.com,*

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L.P., the Federal Circuit concluded that "look and feel" did not render the claims indefinite

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because it had "an established meaning in the art by the relevant timeframe" consistent with how

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the phrase was used in the specification. 773 F.3d 1245, 1261 (Fed. Cir. 2014). Much like *DDR*

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Holdings, "REST" had "an established meaning in the art by the relevant timeframe." *Id*. Thus, a

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person of ordinary skill in the art would be able to read claim 1, apply the common understanding

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of "REST," and know the scope of claim 1 with reasonable certainty.

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        Telesign nevertheless argues that "REST" renders claim 1 indefinite because, in its view,

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the standards for assessing whether an API is "RESTful" are subjective and can be inconsistently

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applied by skilled artisans. This is unpersuasive. First, the Court disagrees that the standards are

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subjective. For example, to the contrary, the interface constraints mentioned in Fieldling's

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dissertation—such as whether an interface uses hypermedia as the engine of the application

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state—are objective. Opening Br. Ex. F at 82. Second, Telesign's support for its assertion that

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1 "REST" standards are inconsistently applied are isolated quotations from web design textbooks,

2 which lament that "REST" has become a "term [that] is often over applied, and not always

3 correctly." Responsive Br. Ex. E at xiii; *see also* Opening Br. Ex. D at 80. However, simply

4 because some skilled artisans had an incorrect view of "REST" does not mean that it was

5 impossible for a skilled artisan to correctly apply "REST" conventions and determine whether an

6 API is "RESTful." Indeed, the fact that *RESTful Web Services* includes an example of a service

7 that was "RESTful" and an example of a service that was not suggests that line drawing was

8 possible. *See* Responsive Br. Ex. D at 15-17.

9   In sum, extrinsic evidence confirms that there was a sufficiently "familiar" or "common

10 understanding" of "REST" at the time of the invention such that a person of ordinary skill in the

11 art would be able to know the scope of claim 1 with reasonable certainty. *Nautilus*, 134 S. Ct. at

12 2124. As such, claim 1 is not indefinite.

13   **2. Claim Construction**

14   Having determined that claim 1 is not indefinite, the Court finds that a modified version of

15 Twilio's proposed construction best reflects the proper construction of "REST API." In general,

16 Twilio's proposal accurately captures what a "REST API" is: simply, an API that is consistent

17 with "REST." However, rather than leaving "REST" undefined (and potentially creating an *O2*

18 *Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008) issue), the

19 Court will include the four interface constraints that Dr. Fielding identified in his dissertation as

20 defining a RESTful interface: "identification of resources; manipulation of resources through

21 representations; self-descriptive messages; and, hypermedia as the engine of application state."

22 Opening Br. Ex. F at 82. Thus, the Court construes "REST API" as "an application programming

23 interface that complies with Representational State Transfer (REST) interface constraints, which

24 are: identification of resources; manipulation of resources through representations; self-descriptive

25 messages; and, hypermedia as the engine of application state."

26   **C. "REST API request" ('376 patent, claims 1, 14)**

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Twilio's Proposed Construction	Telesign's Proposed Construction
An application programming interface request that is operable with the Representation State Transfer (REST) conventions	Not an independent term for construction. "REST API" will depend from term #14, and any further construction is plain and ordinary.

The term "REST API request" appears in claims 1 and 14 of the '376 patent. For example,

claim 1 of the '376 patent recites:

1. A method comprising:

    operating a telephony network and internet connected system cooperatively with a plurality of application programming Interface (API) resources, wherein operating the system comprises:

        initiating a telephony session,

        communicating with an application server to receive an application response,

        converting the application response into executable operations to process the telephony session,

        creating at least one informational API resource; and

    exposing the plurality of API resources through a representational state transfer (REST) API that comprises:

        receiving a **REST API request** that specifies an API resource URI, and

        responding to the API request according to the request and the specified resource URI.

'376 patent at col. 18:29-45 (emphasis added).

Twilio proposes that this term should be construed as "[a]n application programming

interface request that is operable with the Representation State Transfer (REST) conventions"—

effectively, its proposed construction for "REST API" with the addition of the word "request."

Opening Br. 10-11. Telesign does not brief this term apart from "REST API." *See* Responsive

Br. 6-13. The Court discerns no difference between Twilio's proposed construction and simply

leaving this term unconstrued. Either way, the Court's construction of "REST API" is combined

with the word "request."

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D. "telephony instructions" ('021 patent, claim 1; '465 patent, claim 1)

Twilio's Proposed Construction	Telesign's Proposed Construction
Instructions for the operation of a telephony system	instructions for the operation of a telephony system rather than standard web servers and web applications

The term "telephony instructions" appears in claim 1 of the '021 patent and claim 1 of the

'465 patent. Claim 1 of the '021 patent recites:

1. A method of processing telephony sessions comprising:

communicating with an application server using an application layer protocol;

processing **telephony instructions** with a call router;

creating call router resources accessible through a call router Application
Programming Interface (API), wherein the call router resources are
accessible by outside devices at an addressable Uniform Resource
Identifier (URI);

mapping a telephony session to the URI, the URI being associated with the
application server;

sending a request to the application server;

embedding state information of the telephony session in the request;

receiving from the application server a response comprising **telephony
instructions** for sequential processing;

storing state information in the URI of a call router resource;

modifying call router resources to alter the state of the call router; and

interacting with media of the call router according to the call router API.

'021 patent at col. 18:34-55 (emphasis added). Claim 1 of the '465 patent recites:

1. A method for processing a telephony communication comprising:

associating an initial URI with a telephony endpoint;

initiating a telephony voice session for a telephony communication to the
telephony endpoint;

mapping the initial URI to the telephony session;

sending an application layer protocol request to an application resource
specified by the URI and embedding state information of the telephony
voice session in the request;

receiving a response to the application layer protocol request sent to the
application resource, wherein the response includes a document of
telephony instructions; and

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> executing telephony actions during the telephony voice session according to a sequential processing of at least a subset of the **telephony instructions** of the response.

'465 patent at col. 18:38-54 (emphasis added).

Twilio argues that this term should be construed as "[i]nstructions for the operation of a telephony system." Opening Br. 11-12. Telesign argues that this term should be construed as "instructions for the operation of a telephony system rather than standard web servers and web applications." Responsive Br. 13-14. Thus, the parties agree that "telephony instructions" are "[i]nstructions for the operation of a telephony system," but disagree as to whether this necessarily excludes "instructions for the operation of . . . standard web servers and web applications." For the reasons discussed below, the Court agrees with Telesign.

1. Claim Language and Specification

The Court begins with the claim language. Claim 1 of the '021 patent recites that "telephony instructions" are "receiv[ed] from the application server" and "process[ed]" "sequentially" "with a call router." '021 patent at col. 18:34-55. Claim 1 of the '465 patent recites that "telephony instructions" are "receiv[ed]" in response to a "request sent to the application resource" and that "sequential processing" of the telephony instructions results in "executing telephony actions during the telephony voice session." '465 patent at col. 18:38-54. Although the wording varies between these claims, they recite a similar concept: "telephony instructions" are things that are received from an application server, processed sequentially, and then (in the case of claim 1 of the '465 patent) executed in a telephony communication.

Taking this observation from the claim language and applying it in the context of the specification, it is clear that "telephony instructions" refers to instructions that are executed on a telephony system, not web servers or web applications. As discussed above in Section I.A., the Asserted Patents relate to "processing a telephony session" where a "call router" sits in between a modern application server and a traditional communication network and translates between the two. '021 patent at col. 6:49-8:5, 13:12-14:14. In operation, the call router will take an input signal from the telephony system (i.e., a number that a user pressed on the telephone's keypad),

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translate it into a web request, and send that to the application server. *Id.* at col. 6:15-37. The application server then determines the next action that should be taken and sends that information back to the call router as a web response. *Id.* at col. 6:38-8:5. The call router then receives this web response and converts it into a "telephony action," which are corresponding telephone signals sent over the telephone network. *Id.* at col. 6:49-8:4.

Reading the claim language in light of this disclosure, it becomes clear that the "telephony instructions" are the web response that is sent from the application server to the call router (i.e., which then gets converted into "telephony action"). Both claims recite that the "telephony instructions" are received from an "application server" or "application resource." '021 patent at col. 18:34-55; '465 patent at col. 18:38-54. Thus, they flow *from* the modern application server *to* the traditional communication network, not the other way around. As such, they are "instructions for the operation of a telephony system" and not for "standard web servers and web applications." Telesign's proposed construction accurately reflects this.

Twilio nevertheless contends that Telesign's proposed construction is too narrow because, according to Twilio, the specification indicates that "telephony instructions" may be handled with standard web servers and applications. Opening Br. 12. Twilio bases this argument on a single excerpt from the specification, which reads: "Step S3, which recites mapping the call to a Universal Resource Identifier (URI), functions to enable a telephony session to be converted into a format that may be handled with standard web servers and web applications." '021 patent at col. 3:54-57. Twilio mischaracterizes the specification. This excerpt refers to a different part of the process where, after a user initiates a telephony session, the call router maps that call to a URI. *Id.* at col. 3:54-4:10. The "may be handled" language refers to the fact that input signals received from the telephony system will be translated by the call router to web requests, so that those web requests "may be handled" with web servers and applications. *See id.* It says nothing about the "telephony instructions," which are part of the response received from the application server after it has processed the web requests. *Id.* at col. 6:15-48.

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2. Conclusion

In sum, the Court construes "telephony instructions" as "instructions for the operation of a telephony system rather than standard web servers and web applications."

E. "telephony endpoint" ('465 patent, claims 1, 4-5, 9, 13)

Twilio's Proposed Construction	Telesign's Proposed Construction	Parties' Agreed-Upon Construction
An end-user-device identifier, such as a telephone number or mobile device address	a phone number or SIP address	An end-user-device identifier, such as a telephone number or mobile device address

The term "telephony endpoint" appears in claims 1, 4-5, 9, and 13 of the '465 patent. For example, claim 1 of the '465 patent recites:

1. A method for processing a telephony communication comprising:

    associating an initial URI with a **telephony endpoint**;

    initiating a telephony voice session for a telephony communication to the **telephony endpoint**;

    mapping the initial URI to the telephony session;

    sending an application layer protocol request to an application resource specified by the URI and embedding state information of the telephony voice session in the request;

    receiving a response to the application layer protocol request sent to the application resource, wherein the response includes a document of telephony instructions; and

    executing telephony actions during the telephony voice session according to a sequential processing of at least a subset of the telephony instructions of the response.

'465 patent at col. 18:38-54 (emphasis added).

1. The Parties' Compromise

Initially, the parties proposed different constructions for this term. Twilio proposed that this term should be construed as "[a]n end-user-device identifier, such as a telephone number or mobile device address." Opening Br. 12-13. Telesign, on the other hand, proposed that this term should be construed as "a phone number or SIP[4] address." Responsive Br. 15-16. However, at

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[4] SIP stands for "Session Initiation Protocol." '465 patent, col. 19:14. An "SIP address" generally

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1 the *Markman* hearing, Telesign agreed to adopt Twilio's proposed construction. For the reasons

2 discussed below, the Court agrees with this construction.

3   **2. Analysis of Compromise Position**

4   **a. Claim Language**

5   Claim 1 recites "telephony endpoint" generally, with no limitation on the types of

6 identifiers that can correspond to it. '465 patent, col. 18:38-54. The dependent claims, however,

7 limit "telephony endpoint" to particular types. For example, claim 9 limits "telephony endpoint"

8 to a "phone number," claim 10 limits "telephony endpoint" to an "SIP address," and claim 11

9 limits "telephony endpoint" to either of the two. *Id.* at col. 19:8-14.

10   "Under the doctrine of claim differentiation, each claim in a patent is presumptively

11 different in scope." *Wenger Mfg., Inc. v. Coating Mach. Sys., Inc.*, 239 F.3d 1225, 1233 (Fed. Cir.

12 2001). Although claim differentiation is not a "hard and fast rule of construction," it "is clearly

13 applicable when there is a dispute over whether a limitation found in a dependent claim should be

14 read into an independent claim, and that limitation is the only meaningful difference between the

15 two claims." *Id*. Applying these principles here, claim differentiation counsels that the

16 "telephony endpoint" in claim 1 must at least be broader than either just a "phone number" or an

17 "SIP address."

18   **b. Specification**

19   Nothing in the specification rebuts the presumption that claim differentiation applies.

20 Instead, it confirms that the "telephony endpoint" in claim 1 must be broader than just a "phone

21 number" or an "SIP address." The specification discusses how a telephony endpoint is identified

22 in two primary places. First, in describing the process of mapping a telephony session to a URI,

23 the specification discloses that "the initial URI is assigned to the call via a unique identifier for the

24 call destination, such as a DID (Direct Inbound Dial) phone number, or a VOIP SIP address."

25 '021 patent, col. 3:61-64; *see also id.* at col. 13:47-54 ("The call router 22 preferably associates

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27 refers to the address of an endpoint in a voice-over-IP system. *See* '021 patent, col. 3:63, 6:58.

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1   each incoming phone number with a starting URI 23, . . . by associating the initial URI with the

2   incoming call address (such as DID, SIP address, etc.) . . ."). Second, in describing the "incoming

3   address resource" (a call router API resource that represents the incoming address of a telephony

4   endpoint, *see id.* at col. 10:29-37), the specification discloses that "[t]he incoming address

5   resource of the preferred embodiment functions to allow an application to get, modify, or

6   provision new inbound DID phone numbers, SMS short codes, SIP Addresses, etc. for use with

7   applications." *Id.* at col. 10:29-32.

8   In each of these places, the specification cites phone numbers and SIP addresses only as

9   exemplary embodiments of telephony endpoint identifiers. *Id.* at col. 3:61-64, 10:29-32, 13:47-54.

10   It does not state that identifiers for telephony endpoints must be limited to only these examples;

11   indeed, its mention of "SMS short codes," *id.* at col. 10:31-32, suggests the opposite. It is well

12   established that "particular embodiments appearing in the written description will not be used to

13   limit claim language that has broader effect." *Innova/Pure Water, Inc. v. Safari Water Filtration*

14   *Sys.*, Inc., 381 F.3d 1111, 1117 (Fed. Cir. 2004) (citing *Electro Sci. Indus., Inc. v. Dynamic*

15   *Details, Inc*., 307 F.3d 1343, 1349 (Fed. Cir. 2002); *Laitram Corp. v. NEC Corp*., 163 F.3d 1342,

16   1347-48 (Fed. Cir. 1998)). Thus, because the claim language recites "telephony endpoint"

17   generally, with no limitation on the types of identifiers that can be used, the Court will not limit it

18   to only phone number and SIP address identifiers.

19   **c. Conclusion**

20   In sum, the Court agrees that "telephony endpoint" should be construed as "[a]n end-user-

21   device identifier, such as a telephone number or mobile device address."

22   **F. "application server" ('021 patent, claims 1, 3, 6; '376 patent, claim 1)**

Twilio's Proposed Construction	Telesign's Proposed Construction
Plain and ordinary meaning	a server that processes the "request" to generate the recited "response"[5]

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26   [5] Initially, Telesign proposed that "application server" be construed as "a server that sends API
     requests and processes requests to generate the recited 'response.'" Joint Statement Ex. A at 3. It
27   amended its construction in its Responsive Brief. Responsive Br. 16.

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The term "application server" appears in claims 1, 3, and 6 of the '021 patent and claim 1

of the '376 patent. For example, claim 1 of the '021 patent recites:

   1. A method of processing telephony sessions comprising:

      communicating with an **application server** using an application layer
         protocol;

      processing telephony instructions with a call router;

      creating call router resources accessible through a call router Application
         Programming Interface (API), wherein the call router resources are
         accessible by outside devices at an addressable Uniform Resource
         Identifier (URI);

      mapping a telephony session to the URI, the URI being associated with the
         application server;

      sending a request to the **application server**;

      embedding state information of the telephony session in the request;

      receiving from the **application server** a response comprising telephony
         instructions for sequential processing;

      storing state information in the URI of a call router resource;

      modifying call router resources to alter the state of the call router; and

      interacting with media of the call router according to the call router API.

'021 patent at col. 18:34-55 (emphasis added). As another example, claim 1 of the '376 patent

recites:

   1. A method comprising:

      operating a telephony network and internet connected system cooperatively
         with a plurality of application programming Interface (API) resources,
         wherein operating the system comprises:

         initiating a telephony session,

         communicating with an **application server** to receive an application
            response,

         converting the application response into executable operations to process
            the telephony session,

         creating at least one informational API resource; and

         exposing the plurality of API resources through a representational state
            transfer (REST) API that comprises:

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8,755,376

receiving a REST API request that specifies an API resource URI, and

responding to the API request according to the request and the specified resource URI.

'376 patent at col. 18:29-45 (emphasis added).

Twilio argues that this term should be construed according to its plain and ordinary meaning. Opening Br. 14-15. Telesign argues that this term should be construed as "a server that processes the 'request' to generate the recited 'response.'" Responsive Br. 16-18. For the reasons discussed below, the Court agrees with Telesign.

1. Claim Language

Claim 1 of the '021 patent recites "sending a request to the application server" and then "receiving from the application server a response." '021 patent at col. 18:34-55. It does not explicitly recite that the request and response are related—i.e., that the application server processes the "request" to generate the "response." However, reading the claim as a whole, this is implied. In general, claim 1 recites the end-to-end method of processing a telephony session. *See id*. Thus, it would make sense that the only recited "response" from the application server is generated from the only recited "request" that was sent to it. Accordingly, Telesign's proposed construction is a helpful and accurate clarification of what the claim language already suggests. *See Abbott Labs*., 544 F.3d at 1360 ("'Claim construction' is for the purpose of explaining and defining terms in the claims"). In addition, because it clarifies meaning that is implied but not explicitly stated in the claim, it is not superfluous.

Claim 1 of the '376 patent recites "communicating with an application server to receive an application response." '376 patent at col. 18:29-45. It does not explicitly recite a "request," but the fact that the "application server" is "communicat[ed] with" and then sends a "response" implies this. *See id*. Claim 1 of the '376 patent also does not explicitly recite any relation between the "communicat[ion]" and the "response." but, given that they appear in the same claim limitation, this is implied. *See id*. Thus, as with claim 1 of the '021 patent, Telesign's proposed construction is also a helpful and accurate clarification of what the claim language already

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1   suggests. *See Abbott Labs.*, 544 F.3d at 1360 ("'Claim construction' is for the purpose of

2   explaining and defining terms in the claims"). In addition, because it clarifies meaning that is

3   implied but not explicitly stated in the claim, it is not superfluous. Thus, the claim language

4   supports Telesign's proposed construction.

5   **2. Specification**

6   The specification also supports Telesign's proposed construction. As discussed above in

7   Section I.A., the Asserted Patents relate to "processing a telephony session" where a "call router"

8   sits in between a modern application server and a traditional communication network and

9   translates between the two. '021 patent at col. 6:49-8:5, 13:12-14:14. In operation, the call router

10   will take an input signal from the telephony system (i.e., a number that a user pressed on the

11   telephone's keypad), translate it into a web request, and send that to the application server. *Id.* at

12   col. 6:15-37. The application server then determines the next action that should be taken and

13   sends that information back to the call router as a web response. *Id.* at col. 6:38-8:5. In detailing

14   the operations of the "application server," the specification explicitly states that "the application

15   server 26 functions to provide data processing logic for requests received from the call router 22."

16   *Id.* at col. 14:15-16. It then provides specific examples of corresponding requests and responses

17   that are sent to and from the application server. *Id.* at col. 14:15-15:47. Thus, reading the claims

18   in light of the specification confirms that there is a relationship between the "request" and the

19   "response." As such, the specification supports Telesign's proposed construction.

20   **3. Prosecution History**

21   The prosecution history also supports Telesign's construction. During prosecution, the

22   applicant argued that a prior art reference, U.S. Patent Application No. 2005/0243977 to Creamer

23   ("Creamer"), was distinguishable because it "does not show executing telephony actions

24   responsive to direction *of a single request to and response* from an application server."

25   Responsive Br. Ex. H at 11 (emphasis added). When considered in context with the claim

26   language and the specification, this lends further support for Telesign's proposed construction,

27

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which makes clear that the "response" is generated in response to a single "request."

4. Conclusion

In sum, Telesign's proposed construction is consistent with the claim language, specification, and prosecution history. Further, it provides helpful clarification and is not superfluous. Accordingly, the Court construes "application server" as "a server that processes the 'request' to generate the recited 'response.'"

G. "converting the application response into executable operations to process the telephony session" ('376 patent, claim 1)

Twilio's Proposed Construction	Telesign's Proposed Construction
Plain and ordinary meaning	converting the application "response" from a format that may be handled with standard web servers and web applications into a format that may be handled by telephony equipment

The term "converting the application response into executable operations to process the telephony session" appears in claim 1 of the '376 patent. Claim 1 of the '376 patent recites:

1. A method comprising:

operating a telephony network and internet connected system cooperatively with a plurality of application programming Interface (API) resources, wherein operating the system comprises:

initiating a telephony session,

communicating with an application server to receive an application response,

converting the application response into executable operations to process the telephony session,

creating at least one informational API resource; and

exposing the plurality of API resources through a representational state transfer (REST) API that comprises:

receiving a REST API request that specifies an API resource URI, and

responding to the API request according to the request and the specified resource URI.

'376 patent at col. 18:29-45 (emphasis added).

Twilio argues that this term should be construed according to its plain and ordinary

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1 meaning. Opening Br. 19-20. Telesign argues that this term should be construed as "converting

2 the application 'response' from a format that may be handled with standard web servers and web

3 applications into a format that may be handled by telephony equipment." Responsive Br. 22-23.

4 For the reasons discussed below, the Court agrees with Twilio.

5 **1. Claim Language**

6 Telesign's proposed construction repeats the first portion of the claim limitation

7 ("converting the application response") and then replaces "into executable operations to process

8 the telephony session" with "from a format that may be handled with standard web servers and

9 web applications into a format that may be handled by telephony equipment." Comparing these

10 two final phrases, Telesign's proposed construction is narrower than the claim language itself.

11 Telesign's proposed construction requires a particular conversion from one format to another,

12 while the claim language does not. Nothing in the language of claim 1 indicates that such a

13 formatting restriction is required. Thus, the Court turns to the specification to see if it requires this

14 narrower interpretation.

15 **2. Specification**

16 The specification does not require the construction that Telesign seeks. In what appears to

17 be a corresponding description of the "converting . . ." step, the specification discloses that "[t]he

18 step of processing telephone instructions with a call router S120 preferably functions to convert

19 the server response into telephony actions or executable operations during a telephony session."

20 '021 patent at col. 6:49-51. It then discloses several exemplary "mime-types" or data formats that

21 the server response can contain, including "XML," "MP3," and "plain text." *Id.* at col. 6:63-7:3.

22 It also discloses several exemplary telephony actions that the server response can be converted

23 into, including:

24 playing a pre-recorded sound file at a server-specified URI (such as a static mp3
file located at http://demo.twilio.com/myapp/1234.mp3), reading text to the caller

25 using text-to-speech technology, calling another number (such as creating a new
voice connection through the PSTN, SIP/VoIP, or other IP technology system),

26 collecting digits via DTMF input, recording voice response audio, TTY or other

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inputs, sending an SMS message, or any suitable combination or sequence of these or other suitable actions.

Id. at col. 6:35-61.

While this disclosure seems to lend some support to Telesign's proposed construction, it is at best a description of preferred embodiments. "[P]articular embodiments appearing in the written description will not be used to limit claim language that has broader effect." *Innova/Pure Water*, 381 F.3d at 1117 (citations omitted). Here, the claim language does indeed have a "broader effect" than just these exemplary embodiments: it requires the response to be converted into "executable operations to process the telephony session," without regard to particular formats used. Thus, the Court finds that, even reading the claims in light of the specification, the narrower construction proposed by Telesign is not warranted.

3. Conclusion

In sum, nothing in the claims or specification warrants the narrower construction that Telesign proposes. Instead, the claim language is sufficiently clear, and its meaning to a person of ordinary skill in the art would be "readily apparent" to a lay jury. *Phillips*, 415 F.3d at 1314. Accordingly, the Court adopts Twilio's proposal and construes this term according to its plain and ordinary meaning.

H. "telephony session/telephony voice session" ('021 patent, claims 1, 2, 12; '465 patent, claims 1, 4, 13; '376 patent, claims 1, 3, 5, 19)

Twilio's Proposed Construction	Telesign's Proposed Construction
Plain and ordinary meaning	a back and forth exchange of telephony signals

The term "telephony session/telephony voice session" appears in claims 1, 2, and 12 of the '021 patent, claims 1, 4, and 13 of the '465 patent, and claims 1, 3, 5, and 19 of the '376 patent. For example, claim 1 of the '021 patent recites:

1. A method of processing **telephony sessions** comprising:

communicating with an application server using an application layer protocol;

processing telephony instructions with a call router;

creating call router resources accessible through a call router Application Programming Interface (API), wherein the call router resources are accessible by outside devices at an addressable Uniform Resource

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Identifier (URI);

mapping a **telephony session** to the URI, the URI being associated with the
application server;

sending a request to the application server;

embedding state information of the **telephony session** in the request;

receiving from the application server a response comprising telephony
instructions for sequential processing;

storing state information in the URI of a call router resource;

modifying call router resources to alter the state of the call router; and

interacting with media of the call router according to the call router API.

'021 patent at col. 18:34-55 (emphasis added).

Twilio argues that this term should be construed according to its plain and ordinary

meaning. Opening Br. 20-21. Telesign argues that this term should be construed as "a back and

forth exchange of telephony signals." Responsive Br. 13-14. For the reasons discussed below, the

Court agrees with Twilio.

1. Claim Language

Comparing Telesign's proposal with the claim language, it is at least unnecessary, if not

inconsistent. In general, as discussed above in Section III.F., the claims recite a single iteration of

sending a telephony signal through the call router to an application server (with the appropriate

translation process) and then receiving a response back. *See* '021 patent at col. 18:34-55; '465

patent at col. 18:38-54; '376 patent at col. 18:29-45. Telesign's proposed construction could be

read as either suggesting a back and forth of multiple telephony signals from a telephony endpoint,

or a back and forth of a single telephony signal from a telephony endpoint with a responsive

telephony signal from the call router. The former is inconsistent with the claim language, which,

as just discussed, recites only a single iteration. The latter is unnecessary, as this type of back and

forth is already captured in the specific steps recited in the claims. *See Digital-Vending Servs.*

Int'l, LLC v. Univ. of Phoenix, Inc., 672 F.3d 1270, 1275 (Fed. Cir. 2012) ("Claims are interpreted

with an eye toward giving effect to all terms in the claim."). Thus, even based on the claim

language alone, Telesign's proposed construction should be rejected.

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2. Conclusion

In sum, Telesign's proposed construction is superfluous of the claim language, and thus is not needed to resolve the parties' dispute or clarify the meaning of "telephony session" for the jury.[6] Accordingly, the Court adopts Twilio's proposal and construes "telephony session" according to its plain and ordinary meaning.

I. "processing telephony sessions" / "process the telephony session" / "processing a telephony communication" ('021 patent, claim 1; '465 patent, claim 1; '376 patent, claim 1)

Twilio's Proposed Construction	Telesign's Proposed Construction
Plain and ordinary meaning	converting a "response" into telephony actions or executable operations during a "telephony session"

The term "processing telephony sessions" / "process the telephony session" / "processing a telephony communication" appears in claim 1 of the '021 patent, claim 1 of the '465 patent, and claim 1 of the '376 patent. Claim 1 of the '021 patent recites:

1. A method of **processing telephony sessions** comprising:

   communicating with an application server using an application layer protocol;

   processing telephony instructions with a call router;

   creating call router resources accessible through a call router Application Programming Interface (API), wherein the call router resources are accessible by outside devices at an addressable Uniform Resource Identifier (URI);

   mapping a telephony session to the URI, the URI being associated with the application server;

   sending a request to the application server;

   embedding state information of the telephony session in the request;

   receiving from the application server a response comprising telephony instructions for sequential processing;

---

[6] The Court notes that, in its briefing, Telesign also argues that a lay jury would not understand what a "telephony session" is in the context of the patents. Responsive Br. 14. The Court disagrees. "Telephony" and "session" are both common words that do not carry with them any specialized or technical meaning. As such, they would be "readily understood" by a lay jury. In addition, a lay jury would be able to put them together and understand the phrase "telephony session," especially when placed in the context of the rest of the claim language. Thus, no clarifying or guiding instruction is needed here.

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storing state information in the URI of a call router resource;

modifying call router resources to alter the state of the call router; and

interacting with media of the call router according to the call router API.

'021 patent at col. 18:34-55 (emphasis added). Claim 1 of the '465 patent recites:

> 1. A method for **processing a telephony communication** comprising:
>
> associating an initial URI with a telephony endpoint;
>
> initiating a telephony voice session for a telephony communication to the telephony endpoint;
>
> mapping the initial URI to the telephony session;
>
> sending an application layer protocol request to an application resource specified by the URI and embedding state information of the telephony voice session in the request;
>
> receiving a response to the application layer protocol request sent to the application resource, wherein the response includes a document of telephony instructions; and
>
> executing telephony actions during the telephony voice session according to a sequential processing of at least a subset of the telephony instructions of the response.

'465 patent at col. 18:38-54 (emphasis added). Claim 1 of the '376 patent recites:

> 1. A method comprising:
>
> operating a telephony network and internet connected system cooperatively with a plurality of application programming Interface (API) resources, wherein operating the system comprises:
>
> initiating a telephony session,
>
> communicating with an application server to receive an application response,
>
> converting the application response into executable operations to **process the telephony session**,
>
> creating at least one informational API resource; and
>
> exposing the plurality of API resources through a representational state transfer (REST) API that comprises:
>
> receiving a REST API request that specifies an API resource URI, and
>
> responding to the API request according to the request and the specified resource URI.

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'376 patent at col. 18:29-45 (emphasis added).

Twilio argues that this term should be construed according to its plain and ordinary meaning. Opening Br. 21-22. Telesign argues that this term should be construed as "converting a 'response' into telephony actions or executable operations during a 'telephony session.'" Responsive Br. 14-15. For the reasons discussed below, the Court agrees with Twilio.

1. Claim Language

The claim language does not support Telesign's proposed construction. Specifically, with respect to the '021 and '465 patents, Telesign's proposed construction is too narrow. The disputed phrase appears in the preamble, which recites that the method of "processing telephony sessions" (for claim 1 of the '021 patent) or "processing a telephony communication" (for claim 1 of the '465 patent) "compris[es]" all of the remaining steps that are recited in the claim. Telesign's proposed construction only focuses on a single step in these methods: "processing telephony instructions" (for claim 1 of the '021 patent) or "sequential processing of at least a subset of the telephony instructions" (for claim 1 of the '465 patent). As such, it excludes the remaining steps of the claimed method, which are required by the claim language.

With respect to the '376 patent, Telesign's proposed construction is at least superfluous. Claim 1 of the '376 patent recites "communicating with an application server to receive an application response" and "converting the application response into executable operations to process the telephony session." Telesign's proposed construction of "converting a 'response' into . . . executable operations during a 'telephony session'" merely repeats this. Accordingly, Telesign's proposed construction is unwarranted. *See Digital-Vending Servs*., 672 F.3d at 1275 ("Claims are interpreted with an eye toward giving effect to all terms in the claim.").

2. Specification

The specification also counsels against Telesign's proposed construction. The specification mentions "processing telephony sessions" in only two places, both of which state that "processing telephony sessions include[s] the steps of communicating with an application

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1 server using an application layer protocol, processing telephony instructions with a call router, and

2 creating call router resources accessible through an Application Programming Interface (API)."

3 '021 patent at col. 1:63-2:1, 2:50-57. It then goes on to describe each of these three steps in detail,

4 dividing its discussion of each into separate sections. '021 patent at col. 2:59-6:47 (section titled

5 "1A. Communicating with an Application Server"); *id*. at col. 6:48-8:5 (section titled "1B.

6 Processing Telephone Instructions"); *id*. at col. 8:6-12:64 (section titled "1C. Creating Resources

7 Accessible by a Call Router API"). Telesign draws the language for its proposed construction

8 from the opening line of Section 1B, which discloses that "[t]he step of processing telephone

9 instructions with a call router S120 preferably functions to convert the server response into

10 telephony actions or executable operations during a telephony session." '021 patent at col. 6:49-

11 52; *see also id*. at 6:49-65 (describing exemplary telephony actions). However, as the

12 specification makes plain, this "step of processing telephone instructions" is only one of three

13 steps for "processing telephony sessions." '021 patent at col. 1:63-2:1, 2:50-57. Thus, Telesign's

14 proposed construction improperly conflates "processing telephony sessions" with "processing

15 telepho[ny] instructions" and reads out the other two steps of "processing telephony sessions"

16 (i.e., "communicating with an application server using an application layer protocol" and "creating

17 call router resources accessible through an Application Programming Interface (API)").

18 Accordingly, the specification also does not support Telesign's proposed construction.

19   **3. Conclusion**

20   In sum, neither the claim language nor the specification supports Telesign's proposed

21 construction. The Court therefore adopts Twilio's proposal and construes "processing telephony

22 sessions" / "process the telephony session" / "processing a telephony communication" according

23 to its plain and ordinary meaning.

24   **J. "response" ('021 patent, claim 1; '465 patent, claim 1; '376 patent, claim 1)**

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26

Twilio's Proposed Construction	Telesign's Proposed Construction
Plain and ordinary meaning	a communication generated in response to and based on a corresponding request

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The term "response" appears in claim 1 of the '021 patent, claim 1 of the '465 patent, and claim 1 of the '376 patent. For example, claim 1 of the '021 patent recites:

> 1. A method of processing telephony sessions comprising:
>
> communicating with an application server using an application layer protocol;
>
> processing telephony instructions with a call router;
>
> creating call router resources accessible through a call router Application Programming Interface (API), wherein the call router resources are accessible by outside devices at an addressable Uniform Resource Identifier (URI);
>
> mapping a telephony session to the URI, the URI being associated with the application server;
>
> sending a request to the application server;
>
> embedding state information of the telephony session in the request;
>
> receiving from the application server a **response** comprising telephony instructions for sequential processing;
>
> storing state information in the URI of a call router resource;
>
> modifying call router resources to alter the state of the call router; and
>
> interacting with media of the call router according to the call router API.

'021 patent at col. 18:34-55 (emphasis added).

Twilio argues that this term should be construed according to its plain and ordinary meaning. Opening Br. 22-23. Telesign argues that this term should be construed as "a communication generated in response to and based on a corresponding request." Responsive Br. 18-21. The parties' dispute here raises the same issue which the Court already decided with respect to "application server": whether there is a relationship between a "response" and a "request." As discussed above with respect to that term, *see* Section III.F, the Court agrees with Telesign that there is a relationship: the "response" is generated in response to the "request." Thus, the Court adopts Telesign's proposal and construes "response" as "a communication generated in response to and based on a corresponding request."

IV.   CONCLUSION

For the foregoing reasons, the Court construes the disputed claim terms as follows:

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1. "URI" as "a compact sequence of characters that identifies an abstract or physical resource;"

2. "REST API" as "an application programming interface that complies with Representational State Transfer (REST) interface constraints, which are: identification of resources; manipulation of resources through representations; self-descriptive messages; and, hypermedia as the engine of application state;"

3. "telephony instructions" as "instructions for the operation of a telephony system rather than standard web servers and web applications;"

4. "telephony endpoint" as "[a]n end-user-device identifier, such as a telephone number or mobile device address;"

5. "application server" as "a server that processes the 'request' to generate the recited 'response;'"

6. "converting the application response into executable operations to process the telephony session" as plain meaning;
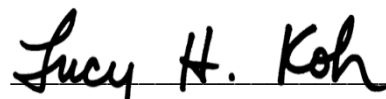
7. "telephony session/telephony voice session" as plain meaning;

8. "processing telephony sessions" / "process the telephony session" / "processing a telephony communication" as plain meaning; and

9. "response" as "a communication generated in response to and based on a corresponding request."

IT IS SO ORDERED.

Dated: October 13, 2017

_____
LUCY H. KOH
United States District Judge

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